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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,288	08/22/2003	Torsten Wipiejewski	G&C 122.27-US-U1	9392
22462	7590	06/23/2005	EXAMINER	
GATES & COOPER LLP HOWARD HUGHES CENTER 6701 CENTER DRIVE WEST, SUITE 1050 LOS ANGELES, CA 90045			VAN ROY, TOD THOMAS	
			ART UNIT	PAPER NUMBER
			2828	

DATE MAILED: 06/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/646,288	Applicant(s) WIPIEJEWSKI ET AL.	
	Examiner <i>T. Van Roy</i> Tod T. Van Roy	Art Unit 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-57 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-57 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/09/2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>08/22/2003</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Drawings

Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claims 1, 4, 12-19, 20, 31-38, 39, and 50-57 are objected to because of the following informalities:

Claim 1 line 9 reads: "to another one of the sections", based on the disclosure it is believed that this would be more appropriately read as: "to said one or more sections".

Claim 4 line 19 reads: "modulator section is inverted", and is believed would be more appropriately read as: "modulator section that is inverted".

The last line of claims 1, 20, and 39 each read: "off-state of the modulator section of the laser", based on the disclosure it is believed that this would be more appropriately

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read as: "off-state of the modulator section of the optoelectronic device", as the laser is one portion of the total device as is disclosed.

The last line of claims 12, 14, 16, 18-19, 31, 33, 35, 37-38, 50, 52, 54, and 56-57 each state the on-off condition being placed on the "laser" while it is believed that this condition should be placed on the "modulator" based on the disclosure.

The third line of claims 13, 15, 32, 34, 51, and 53, and fourth line of claims 17, 36, and 55 each state the on-off state or phase shift condition being placed on the "laser" while it is believed that this condition should be placed on the "modulator" based on the disclosure.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

Claims 7, 26, and 45 recite the limitation "modulator section signal" in the second line.

There is insufficient antecedent basis for the limitations in these claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-3, 5-10, 12-13, 20-22, 24-29, 31-32, 39-41, 43-48, and 50-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adams et al. (US 5991323) in view of Henmi et al. ("Prechirp technique as a linear dispersion compensation for ultrahigh-speed long-span intensity modulation directed detection optical communication systems," 1994, J. of Lightwave Technology, 12:1706-1719).

With respect to claims 1, 20, and 39, Adams teaches an optoelectronic device comprising: a multiple section laser (fig.3 #14,12), a modulator section monolithically integrated with the laser (fig.3 #40, col.7 lines 58-61) and a circuit for adjusting a chirp of the optoelectronic device by applying a compensation electrical signal (fig.3 #30,18,16) to one or more sections of the laser (fig.3 #30 connected to section #14); wherein modulation of the laser by the modulator section causes a parasitic chirp (fig.3 #40, col.7 lines 58-67, wherein the applied bias would cause an index change and inherently cause a chirp), and the compensating electrical signal is applied to a section of the laser to change a wavelength of the laser's output (col.3 lines 28-33). Adams does not teach the wavelength to be changed during an optical on-off transition state of the modulator. Henmi teaches an optoelectronic system in which wavelength changes

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are made during an on-off transition of the modulator signal (fig.3, wavelength of modulated laser output changing (a,c) as modulator envelope varies during on-off state). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the optoelectronic device of Adams with the wavelength change of Henmi in order to allow for pre-chirp signal generation to pre-equalize a transmission delay due to transmission optical fiber chromatic dispersion (Henmi, col.6 lines 4-8).

With respect to claims 2, 21, and 40, Adams and Henmi teach the optoelectronic device as outlined in the rejection to claim 1, and further teach the laser to be widely tunable (Adams, col.3 line 16).

With respect to claims 3, 22, and 41, Adams and Henmi teach the optoelectronic device as outlined in the rejection to claim 1, and further teach the modulator section to comprise an electro-absorption modulator (Adams, col.3 lines 61-62).

With respect to claims 5, 24, 43, 6, 25, and 44, Adams and Henmi teach the optoelectronic device as outlined in the rejection to claim 1, and further teach amplitude and phase adjustments to be made to the compensating electrical signal (Adams, col.3-4 lines 58-25, wherein the pre-chirp signal is partially adjusted to compensate for the power and phase of the pulse in order to properly match with the Schroedinger calculation results (figs. 5-6)).

With respect to claims 7, 26, and 45, Adams and Henmi teach the optoelectronic device as outlined in the rejection to claim 1, and further teach that delay adjustments are made to the modulator section signal (Adams, col.7 lines 63-64, wherein the on-off switching is done by way of delay between adjacent on states).

With respect to claims 8, 27, and 46, Adams and Henmi teach the optoelectronic device as outlined in the rejection to claim 1, and further teach that delays are made to the compensating electrical signal (Adams, col.3 lines 44-48).

With respect to claims 9, 10, 28, 29, 47, and 48, Adams and Henmi teach the optoelectronic device as outlined in the rejection to claim 1, and further teach the compensating electrical signal to be optimized based on an emission wavelength of the output (Adams, col.3 lines 61-63) and derived from a calibration (Adams, col.3 lines 61-64) to optimize amplitude, phase (Adams, col.3-4 lines 58-25, wherein the pre-chirp signal is partially adjusted to compensate for the power and phase of the pulse in order to properly match with the Schroedinger calculation results (figs. 5-6)), and electrical delay (Adams, col.3 lines 44-48).

With respect to claims 12-13, 31-32, and 50-51, Adams and Henmi teach the optoelectronic device as outlined in the rejection to claim 1, and further teach the compensating signal to be applied to the gain section of the laser (Adams, col.4 lines 64-65, wherein the second multi-quantum well region would include gain components), to change a wavelength of the laser's output (Adams, col.3 lines 29-34), and thereby resulting a phase shift of the laser's output (Adams, col.5 lines 66-67).

Claims 4, 23, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adams in view of Henmi and further in view of Verboom et al. (US 6891868).

With respect to claims 4, 23, and 42, Adams and Henmi teach the optoelectronic device as outlined in the rejection to claim 1, including applying data to the modulator

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section (Adams, fig.3 #42), but do not teach the data to be inverted in sign and filtered. Verboom teaches a laser driving circuit that includes a feedback network that inverts, amplifies, and filters the input data signal to the diode (col.3 lines 19-27, which would clear up noise allowing for clearer leading and trailing signal edge transitions). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the optoelectronic device of Adams and Henmi with the inverted, amplified, and filtered data signal of Verboom in order to allow for noise cancellation in the system (Verboom, col.3 lines 24-27).

Claims 11, 30, and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adams in view of Henmi and further in view of Svenson (US 2004/0264535).

With respect to claims 11, 30, and 49, Adams and Henmi teach the optoelectronic device as outlined in the rejection to claim 1, but do not teach the compensating signal to be changed over time for fluctuations in laser characteristics. Svenson teaches an integrated laser and modulator wherein feedback is used to maintain and adjust the compensating signals due to changes in laser characteristics ([0007] lines 16-29, modulation signal effects output light which is being monitored). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the optoelectronic device of Adams and Henmi with the feedback of Svenson in order to maintain a constant output power and frequency from the laser system.

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Claims 14-17, 33-36, and 52-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adams in view of Henmi and further in view of Coldren (US 4896325).

With respect to claims 14-15, 33-34, and 52-53, Adams and Henmi teach the optoelectronic device as outlined in the rejection to claim 1, but do not teach the compensating signal (which is used to adjust the wavelength) to be applied to a forward biased phase section inside the laser cavity and that the output be phase shifted. Coldren teaches a forward biased phase section (col.3 lines 61-65, speaking of using a forward biasing scheme to change the index in the phase section, certain setbacks are noted in the text, but the biasing scheme is taught and is shown to have reasonable results, also see MPEP 2123 Merck & Co. v. Biocraft Laboratories, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989), which states that a reference may be relied upon even if the prior art teaches away from a disclosed embodiment, i.e. the forward biasing setbacks) inside of a laser cavity which is used for wavelength adjustments (fig.3 #32, col.1 lines 47-53) and that leads to a phase shift in the laser (col.1 line 47). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the optoelectronic device of Adams and Henmi with the forward biased phase shifting section of Coldren in order to allow for fine-tuning of the wavelength to match with a given optical system (Coldren, col.2 lines 3-15).

With respect to claims 16-17, 35-36, and 54-55, Adams and Henmi teach the optoelectronic device as outlined in the rejection to claim 1, but do not teach the compensating signal (which is used to adjust the wavelength) to be applied to a reverse

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biased phase section inside the laser cavity and that the output be phase shifted.

Coldren teaches a reverse biased phase section (col.3-4 lines 66-3, speaking of using a reverse biasing scheme to change the index in the phase section) inside of a laser cavity which is used for wavelength adjustments (fig.3 #32, col.1 lines 47-53) and that leads to a phase shift in the laser (col.1 line 47). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the optoelectronic device of Adams and Henmi with the reverse biased phase shifting section of Coldren in order to allow for fine-tuning of the wavelength to match with a given optical system (Coldren, col.2 lines 3-15).

Claims 18-19, 37-38, and 56-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adams in view of Henmi and further in view of Coldren and Tanaka (US 2002/0048290).

With respect to claims 18-19, 37-38, and 56-57, Adams, Henmi, and Coldren teach the optoelectronic device as outlined in the rejections to claims 14-17, 33-36, and 52-55 above, including the teaching of the applying the compensating electrical signal to forward and reverse biased phase sections inside of a laser's cavity. Adams, Henmi, and Coldren do not teach the use of phase sections outside of the laser's cavity. Tanaka teaches an integrated laser and modulator device in which a second integrated modulator ([0060] lines 13-24, causing a phase shift due to the applied bias inducing refractive index changes) is used outside of the laser cavity (fig.7 #2a). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the

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optoelectronic device and biasing scheme of Adams, Henmi, and Coldren with the additional external modulator (phase shifter) of Tanaka in order to allow for additional reduction of chirp (Tanaka, [0060] lines 20-24).

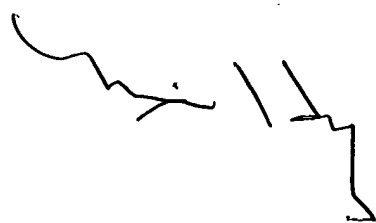
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tod T. Van Roy whose telephone number is (571)272-8447. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571)272-1835. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TVR



**MINSUN OH HARVEY
PRIMARY EXAMINER**